Claims

1. A method for removing contaminate particulate matter from a contaminate particle containing substrate surface comprising the steps of:

applying a sacrificial coating of a material to a substrate surface containing undesirable particulate matter thereon, which material is to encapsulate and suspend the undesirable particles therein;

fluidizing the material if necessary;

applying energy to the coated substrate to dislodge at least some of the particulate matter from the surface of the substrate into the sacrificial coating such that the particulate matter is partially or fully encapsulated and suspended within the sacrificial coating forming a particulate matter containing sacrificial material coating; and

removing the particulate matter containing sacrificial material coating from the substrate surface providing a substrate surface having less particulate matter thereon.

2. The method of claim 1 wherein the substrate is a semiconductor wafer.

3. The method of claim 1 wherein the sacrificial coating material is a fluid.

4. The method of claim 1 wherein the energy used is sonic energy.

5. The method of claim 1 wherein the energy used is thermal, centrifugal, magnetic or vibrational.

6. The method of claim 1 wherein the sacrificial coating material is a liquid.

7. The method of claim 1 wherein the sacrificial coating material is a curable polymer.

8. The method of claim 7 wherein the sacrificial coating material is formed into a film.

9. The method of claim 1 wherein the substrate is inclined and the material is a sacrificial coating applied to an upper part of the substrate so that the sacrificial coating material flows downward over the substrate surface and removes contaminant particles therefrom.

10. The method of claim 1 ~~wherein~~ the material is a gas, liquid, vapor or ~~fluid~~ polymer.

11. An apparatus for removing contaminate particulate matter from a contaminate particle containing substrate surface comprising:

a support for supporting a substrate containing undesirable particulate matter on the surface of the substrate;

means for applying a sacrificial material coating on the surface of the substrate, which material is to encapsulate and suspend the undesirable particles therein;

means for fluidizing the material if necessary;

energy forming means to dislodge at least some of the particulate matter from the surface of the substrate into the sacrificial material coating such that the particulate matter is partially or fully encapsulated and suspended within the sacrificial material coating forming a particulate matter containing sacrificial material coating; and

means for removing the particulate matter containing sacrificial material coating from the surface of the substrate providing a cleaned substrate surface.

12. The apparatus of claim 11 wherein the substrate is a semiconductor wafer.

13. The apparatus of claim 11 wherein the sacrificial coating material is a fluid.

14. The apparatus of claim 11 wherein the energy is sonic energy.

15. The apparatus of claim 11 wherein the energy means is thermal, centrifugal, magnetic or vibrational.

16. The apparatus of claim 11 wherein the sacrificial coating material is a liquid.

17. The apparatus of claim 11 wherein the sacrificial coating material is a curable polymer.

18. The apparatus of claim 17 wherein the sacrificial coating material is formed into a film.

19. The apparatus of claim 11 wherein means are provided to incline the substrate and the sacrificial material applied to the upper part of the inclined substrate flows downward over the substrate and removes contaminant particles therefrom.

20. The apparatus of claim 11 wherein the material is a gas, liquid, vapor or fluid polymer.

21. A semiconductor electronic component made using the method of claim 1.

22. A semiconductor electronic component made using the method of claim 4.

23. A semiconductor electronic component made using the method of claim 5.

24. A semiconductor electronic component made using the method of claim 7.

25. A semiconductor electronic component made using the method of claim 9.